

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Suppose we look at a photograph of many galaxies. Assuming that all galaxies formed at the same time after the Big Bang, which galaxy appears to us as the youngest? 1) _____
A) the galaxy that appears bluest to us
B) the galaxy that is furthest from us
C) the galaxy that appears largest to us
D) the galaxy that is closest to us
E) All galaxies would appear to have the same age.
- 2) Which of the following is smallest? 2) _____
A) 1 light-second
B) size of a typical planet
C) 1 AU
D) size of a typical star
- 3) Suppose we imagine the Sun to be about the size of a grapefruit (about 10 cm across). How far away are the nearest stars (the three stars of Alpha Centauri)? 3) _____
A) 25,000 miles
B) the length of a football field
C) 2.5 miles
D) 2,500 miles
E) 250 miles
- 4) Which of the following best describes the Milky Way Galaxy? 4) _____
A) a spherically shaped collection of about 1 million stars that is about 100 light-years in diameter
B) a spiral galaxy with a disk about 100,000 light-years in diameter and containing between 100 billion and 1 trillion stars
C) a spherically shaped collection of stars including our solar system and about a dozen other solar systems, stretching about 4 light-years in diameter
D) a spiral galaxy with a disk about 100,000 light-years in diameter and containing about 100,000 stars
E) a spiral galaxy with a disk about a billion kilometers in diameter and containing between 100 million and 1 billion stars
- 5) How many galaxies are there in the observable universe? 5) _____
A) roughly (within a factor of 10) the same as the number of stars in our galaxy
B) roughly a thousand times more than the number of stars in our galaxy
C) infinity
D) about as many as the number of stars we see in the sky with our naked eyes
E) about as many as the number of grains of sand on all the beaches on Earth

- 6) By studying distant galaxies in the 1920s, Hubble made the following important discovery that led us to conclude that the universe is expanding. 6) _____
- A) All galaxies were born at the same time, and all will die at the same time.
 - B) All galaxies outside the Local Group are orbiting the Local Group.
 - C) All galaxies contain billions of stars, and all galaxies have spiral shapes.
 - D) All galaxies outside the Local Group are moving away from us, and the farther away they are, the faster they're going.
 - E) All galaxies outside the Local Group are moving away from us, and all are moving away at nearly the same speed.
- 7) From the fact that virtually every galaxy is moving away from us and more distant galaxies are moving away from us at a faster rate than closer ones, we conclude that 7) _____
- A) the universe is expanding.
 - B) the farthest galaxies will eventually be moving faster than the speed of light.
 - C) the universe is shrinking.
 - D) the Milky Way Galaxy is expanding.
 - E) we are located at the center of the universe.
- 8) Which of the following statements about the Milky Way Galaxy is *not* true? 8) _____
- A) The galaxy is about 100,000 light-years in diameter.
 - B) Our solar system is located very close to the center of the Milky Way Galaxy.
 - C) One rotation of the galaxy takes about 200 million years.
 - D) It contains between 100 billion and 1 trillion stars.
- 9) Which of the following statements about the celestial equator is true *at all* latitudes? 9) _____
- A) It cuts the dome of your local sky exactly in half.
 - B) It lies along the band of light we call the Milky Way.
 - C) It extends from your horizon due north, through your zenith, to your horizon due south.
 - D) It represents an extension of Earth's equator onto the celestial sphere.
 - E) It extends from your horizon due east, through your zenith, to your horizon due west.
- 10) What is a *circumpolar* star? 10) _____
- A) a star that always remains above your horizon
 - B) a star that is visible from the Arctic or Antarctic circles
 - C) a star that is close to the south celestial pole
 - D) a star that is close to the north celestial pole
 - E) a star that makes a daily circle around the celestial sphere
- 11) What makes the North Star, Polaris, special? 11) _____
- A) It can be used to determine your longitude on Earth.
 - B) It is the brightest star in the sky.
 - C) It is the star straight overhead.
 - D) It appears very near the north celestial pole.
 - E) It is the star directly on your northern horizon.

- 12) Which of the following statements about constellations is *false*? 12) _____
- A) It is possible to see all the constellations from Earth's equator.
 - B) Most constellations will be unrecognizable hundreds of years from now.
 - C) There are only 88 official constellations.
 - D) Some constellations can be seen in both the winter and summer.
 - E) Some constellations can be seen from both the Northern and Southern hemispheres.
- 13) What effect or effects would be most significant if the Moon's orbital plane were exactly the same as the ecliptic plane? 13) _____
- A) Solar eclipses would be much rarer.
 - B) Solar eclipses would be much more frequent.
 - C) Total solar eclipses would last much longer.
 - D) both A and C
 - E) both B and C
- 14) What conditions are required for a solar eclipse? 14) _____
- A) The phase of the Moon must be new, and the Moon's orbital plane must lie in the ecliptic.
 - B) The phase of the Moon must be full, and the nodes of the Moon's orbit must be nearly aligned with Earth and the Sun.
 - C) The phase of the Moon can be new or full, and the nodes of the Moon's orbit must be nearly aligned with Earth and the Sun.
 - D) The phase of the Moon must be new, and the nodes of the Moon's orbit must be nearly aligned with Earth and the Sun.
 - E) The phase of the Moon must be full, and the Moon's orbital plane must lie in the ecliptic.
- 15) What conditions are required for a lunar eclipse? 15) _____
- A) The phase of the Moon must be full, and the Moon's orbital plane must lie in the ecliptic.
 - B) The phase of the Moon must be new, and the nodes of the Moon's orbit must be nearly aligned with Earth and the Sun.
 - C) The phase of the Moon must be full, and the nodes of the Moon's orbit must be nearly aligned with Earth and the Sun.
 - D) The phase of the Moon must be new, and the Moon's orbital plane must lie in the ecliptic.
 - E) The phase of the Moon can be new or full, and the nodes of the Moon's orbit must be nearly aligned with Earth and the Sun.
- 16) When are eclipse seasons? 16) _____
- A) when the nodes of the Moon's orbit are nearly aligned with the Sun
 - B) in the spring and fall
 - C) when Earth, the Sun, and the Moon are exactly aligned for an eclipse
 - D) during an eclipse
 - E) in the summer and winter
- 17) What happens during the apparent retrograde motion of a planet? 17) _____
- A) The planet rises in the west and sets in the east.
 - B) The planet appears to move eastward with respect to the stars over a period of many nights.
 - C) The planet moves backward in its orbit around the Sun.
 - D) The planet moves through constellations that are not part of the zodiac.
 - E) The planet moves backward through the sky.

- 18) Why were ancient peoples unable to detect stellar parallax? 18) _____
A) They did not look for it.
B) They could not see distant stars.
C) They did not observe for long enough periods of time.
D) They did not have the ability to measure very small angles.
E) They did detect it, but they rejected the observations.
- 19) The path that led to modern science emerged from ancient civilizations in which part of the world? 19) _____
A) North America
B) Southern Asia
C) the Mediterranean and the Middle East
D) China
E) Central and South America
- 20) How did Eratosthenes estimate the size of Earth in 240 B.C.? 20) _____
A) by sending fleets of ships around Earth
B) by measuring the size of Earth's shadow on the Moon in a lunar eclipse
C) by comparing the maximum altitude of the Sun in two cities at different latitudes
D) by observing the duration of a solar eclipse
E) We don't know how he did it since all his writings were destroyed.
- 21) Which of the following statements about scientific models is *true*? 21) _____
A) All current models are correct.
B) A model can be used to explain and predict real phenomena.
C) A model tries to represent all aspects of nature.
D) All models that explain nature well are correct.
E) A model tries to represent only one aspect of nature.
- 22) He developed a system for predicting planetary positions that remained in use for some 1,500 years. 22) _____
A) Ptolemy
B) Kepler
C) Galileo
D) Tycho Brahe
E) Copernicus
- 23) He discovered that the orbits of planets are ellipses. 23) _____
A) Copernicus
B) Tycho Brahe
C) Ptolemy
D) Kepler
E) Galileo
- 24) One of the "nails in the coffin" for the Earth-centered universe was 24) _____
A) the phases of the Moon.
B) the retrograde motion of the planets.
C) eclipses of the Sun.
D) Galileo's observation of stars in the Milky Way.
E) Galileo's observations of the moons of Jupiter.

- 25) Kepler's second law, which states that as a planet moves around its orbit it sweeps out equal areas in equal times, means that 25) _____
- A) a planet travels faster when it is nearer to the Sun and slower when it is farther from the Sun.
 - B) the period of a planet does not depend on its mass.
 - C) planets that are farther from the Sun move at slower average speeds than nearer planets.
 - D) a planet's period does not depend on the eccentricity of its orbit.
 - E) planets have circular orbits.
- 26) What is meant by a scientific *paradigm*? 26) _____
- A) a pseudoscientific idea
 - B) a radical change in scientific thought
 - C) a generally well-established scientific theory or set of theories
 - D) a conundrum, or unexplained set of facts
 - E) a historical theory that has been proved inaccurate
- 27) Which of the following statements about scientific theories is *not* true? 27) _____
- A) A theory cannot be taken seriously by scientists if it contradicts other theories developed by scientists over the past several hundred years.
 - B) A theory is a model designed to explain a number of observed facts.
 - C) A theory must make predictions that can be checked by observation or experiment.
 - D) If even a single new fact is discovered that contradicts what we expect according to a particular theory, then the theory must be revised or discarded.
 - E) A theory can never be proved beyond all doubt; we can only hope to collect more and more evidence that might support it.

Answer Key

Testname: TEST1

- 1) B
- 2) B
- 3) D
- 4) B
- 5) A
- 6) D
- 7) A
- 8) B
- 9) D
- 10) A
- 11) D
- 12) B
- 13) B
- 14) D
- 15) C
- 16) A
- 17) B
- 18) D
- 19) C
- 20) C
- 21) B
- 22) A
- 23) D
- 24) E
- 25) A
- 26) C
- 27) A